

A Note on Perforated Stones

Received 7 April 1975

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BEFORE his departure from Thailand in early 1970, the then British Consul in Chiang Mai, D. C. M. Rivette-Carnac, O.B.E., put in my custody some prehistoric finds which he had collected during his service in the north. Among them was a fragment of a natural, flat water-rolled pebble, which obviously had broken while it was in the process of having a biconical central hole drilled from both of the flat sides.

Later I had an opportunity to survey the find spot, which is in Ban Nong Chalab approximately 15 km north of Muang Tak, Changwat Tak, quite near the left bank of Mae Nam Ping and between this and the old highway linking Muang Tak with Amphoe Thoen. The whole area is rather disturbed due to its seasonal use as a storage place for teak logs, and the only find during the survey was a small Hoabinhian-like pebble tool. In the course of the same survey another two sites of Hoabinhian affinity were discovered at km 5 and km 13 from Muang Tak near the new highway to Thoen. All three sites are located at the lowest river terrace, which is here 6 to 8 m above the low water level of the river.

During the general survey of North Thailand undertaken as part of the prehistoric project of the Scandinavian Institute of Asian Studies Field Research Station at Lampang, another 17 fragments of perforated stones were discovered at six different sites. An additional complete specimen was shown to me by Khun Kraisi Nimmanhaeminda of Chiang Mai. It was found between Chiang Mai and Fang. Still another fragment, said to be from a cave in the Doi Sakhet area of Chiang Mai, was seen in the National Museum in Chiang Mai. However, neither of the latter stones are dealt with here.

The other six sites and the 17 specimens discovered from them are described below.

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MAE CHAM I, BAN OMKUT, AMPHOE MAE CHAM,
CHANGWAT CHIANG MAI

A rather extensive site now largely destroyed and eroded following digging for road construction materials, but also naturally ravined during the rainy season by small brooks forcing their way down the slopes to a nearby hot spring. A total of 851 tools or waste pieces have so far been collected at the site. Unfortunately, neither a survey nor a detailed study of the site has been completed, and the majority of the finds remain unstudied as well. The finds can be referred to five to seven stratified horizons in the loamy soil, the exact number being difficult to establish because of the surface damage and the sloping terrain. Of course the finds, some of which were taken directly from the find horizons but most of which were picked up at the surface, become more and more mixed up the farther down they are collected. In this connection it is noteworthy that all of the perforated stones were found at a rather high level, indicating that they can only originate from the surface or from the topmost find horizon, which is barely 20 cm below the surface. The other finds from this level are clearly of Hoabinhian affinity, as are a majority of all of the finds, one exception being some oblong black small and flat clay stones of subrectangular shape with the natural cortex preserved. By means of small flaking and chipping along one short end, they have been furnished with a cutting edge. The edge is unground, but otherwise they resemble edge-ground adzes typical of "Bacsonian" and so abundant in the north. Another important observation is that the finds generally were in clusters. It is interesting to observe that the perforated stones usually were among the black adzes.

MAE THA II, BAN THA HAN, AMPHOE MAE THA,
CHANGWAT LAMPANG

An Early Palaeolithic site at the highest river terrace (280 m above sea level) in the Lampang intermontane basin, the surface-find tools of which are clearly ascertained to originate from two stratified find horizons in heavily lateritized gravel and a third find horizon right in the top sand of the site.

A perforated stone fragment was found in an adjacent oxcart track which is used by the local population to carry better laterites and basalt boulders from an area behind the site. As another 5 perforated stone fragments are from that area, and as it is indisputably out of context here, it probably originated in the other locality.

MAE THA VIII, BAN THA HAN, AMPHOE MAE THA,
CHANGWAT LAMPANG

No less than 5 fragments of perforated stones are known from this site, and the one from Mae Tha II probably originated here. The site is located about 1 km behind Mae Tha II toward the mountains to the east. Unfortunately information about this site and the finds from it came to my attention so close to my departure from Thailand that other duties, together with the end of the rainy season and the subsequent rice planting, prevented me from undertaking a survey of the site. The fragments were found by the foreman of my workers, who indicated that they are from a heavy sand above the laterites.

MAE MOH II, BAN HANG HUNG, AMPHOE MAE MOH,
CHANGWAT LAMPANG

Another Early Palaeolithic site located at the uppermost river terrace in the Mae Moh valley, which opens into the Lampang basin, and not far from the lignite mine. The Early Palaeolithic surface finds from the site can be referred to a find horizon in the top of a thick heavily lateritized gravel deposit, which in turn is superseded by thick riverine sands. The latter are particularly spoiled here, as digging for road-construction materials and for other purposes is still going on. Because the perforated stone here is otherwise completely out of its natural context, it seems more logical to imagine that it originates from the upper sands, rather than having been brought fortuitously from another site.

PS SITE III, BAN DAN CHUMPOL, AMPHOE RONG KWANG,
CHANGWAT PHRAE

Another Early Palaeolithic site which was excavated in early 1974. One hundred eighty meters above sea level, it is located at the uppermost river terrace in the Phrae intermontane basin at km 12 on Route 101, which connects the Phrae-Nan highway with Amphoe Song and Amphoe Ngao.

The palaeolithic finds here were embedded in lateritized sands and clay, which are superseded by later riverine sands and topsoil. In the latter were found abundant pits, usually with some flaked tools or flakes of late or "epi Hoabinhian" affinity, and good collections of charcoal (samples of which are to be submitted for dating in the very near future).

The perforated stone fragment from this site was found on the surface a few meters from the excavation, at a place where laterite had been dug for road construction. In the profile of the excavation a huge pit was seen right inside the find spot, so it is most likely that the piece was originally in the pit. It should be noted that no pits contained any lateritized soils or had ever been subject to laterization, and they never reached the level of the laterites. It should further be stressed that no perforated stones were among the more than 1800 tools and waste pieces excavated from the laterites.

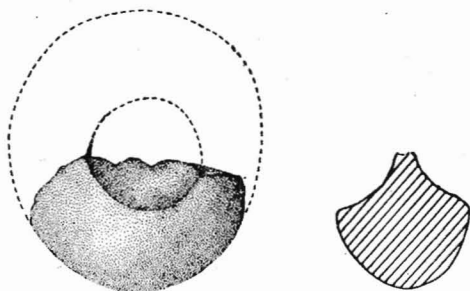
P III, AMPHOE MUANG, CHANGWAT PHRAE

Originally an Early Palaeolithic site covering a big area of the uppermost river terrace in the Phrae intermontane basin, now badly damaged by extensive digging for road construction materials. The palaeolithic pebble tools from the site are all lateritized, with laterite nodules sticking to the surfaces, so their reference to the laterites on the spot is hardly disputable. On the other hand, the fragment of a stone ring found at the site has no traces of laterization whatsoever. As in the cases of Mae Moh II and PS III, it is most likely that the find originates from the site but formerly was in some now removed upper sands.

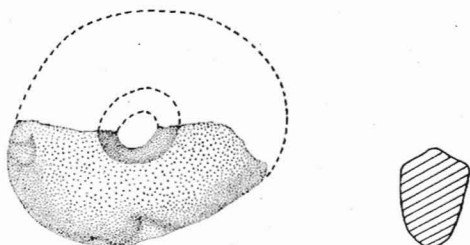
The perforated stones from these sites, including the one from Tak, are described below. For width and length, the reconstructed measurements are given.

*Tak**TI, S. 1* (Fig. 1)

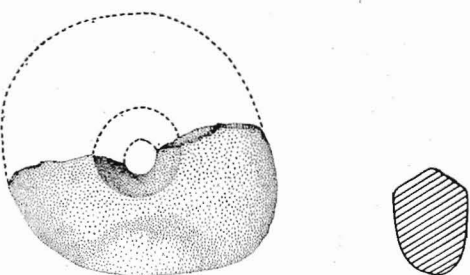
A natural pebble of silicified sandstone with original cortex preserved. Slightly irregular circumference, broken while the central hole was being drilled (drilling unfinished). Thick oval section. Width 11.5 cm by 13 cm; thickness 5.5 cm; upper diameter of perforation 5 cm.

Fig. 1 *TI, S.1* ($\times 1/3$)*Chiang Mai**MC I, 1* (Fig. 2)

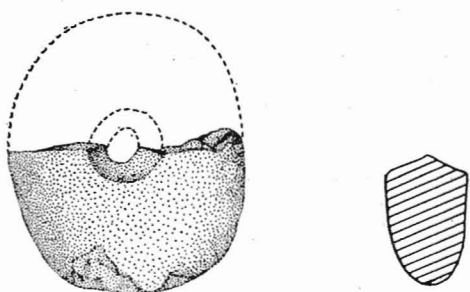
A rhyolite pebble, flat with flat oval section with finished biconical perforation. Broken obliquely to the long axis of the stone. Slightly damaged at one face along the rim. Width 11 cm by 9 cm; thickness 2.3 cm; diameter of perforation 3 cm at top, 1.5 cm at center.

Fig. 2 *MC I, 1* ($\times 1/3$)*MC I, 2* (Fig. 3)

A quartzite pebble, square with rounded corners, flat oval section, and finished biconical central perforation. Broken slightly obliquely across the perforation. Width 12.7 cm square; thickness 3.2 cm; diameter of perforation 3.5 cm at top, 1.5 cm at center.

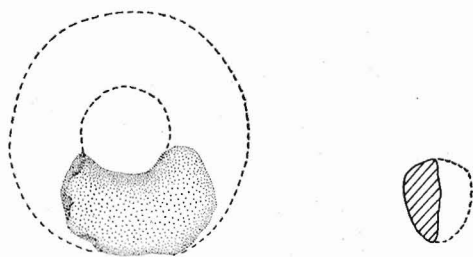
Fig. 3 *MC I, 2* ($\times 1/3$)*MC I, 3* (Fig. 4)

Pebble of quartzitic sandstone, rectangular shape with rounded corners and flat oval section. Biconical finished perforation. Broken transversely across perforation. Slight damage along rim on short end. Width 11.5 cm by 9.5 cm; thickness 3.4 cm; diameter of perforation 2.8 cm at top, 1.3 cm at center.

Fig. 4 *MC I, 3* ($\times 1/3$)

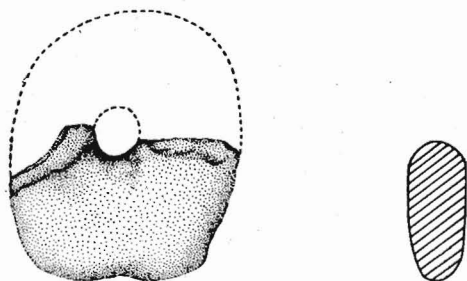
MC I, 269 (Fig. 5)

A small fragment with only one original surface preserved, made on clay stone pebble of almost circular shape with thick oval section. Finished biconical perforation. Broken across perforation and in the plane. Width 8.6 cm by 9 cm; thickness 1.1 cm (Originally 2.4 cm); diameter of perforation 4 cm at top, 3.5 cm at center.

Fig. 5 MC I, 269 ($\times 1/3$)

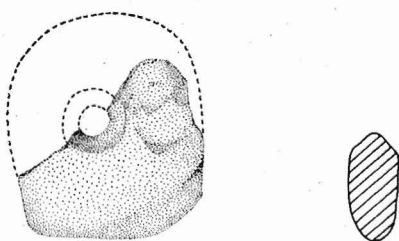
MC I, 502 (Fig. 6)

Flat subrectangular pebble of micaceous siltstone with flat oval section and finished biconical perforation. Broken transversely across the perforation. Width 9.8 cm by 11.5 cm; thickness 2 cm; diameter of perforation 3 cm at top, 2 cm at center.

Fig. 6 MC I, 502 ($\times 1/3$)

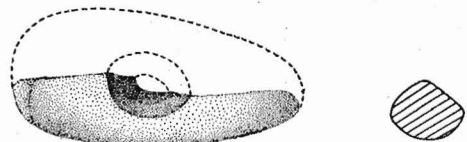
MC I, 531 (Fig. 7)

Flat subrectangular pebble of micaceous siltstone with flat oval section and finished biconical perforation. Broken obliquely to long axis and damaged?/flaked? along one long side. Width 7.8 cm by 9 cm; thickness 1.8 cm; diameter of perforation 2.5 cm at top, 1.4 cm at center.

Fig. 7 MC I, 531 ($\times 1/3$)

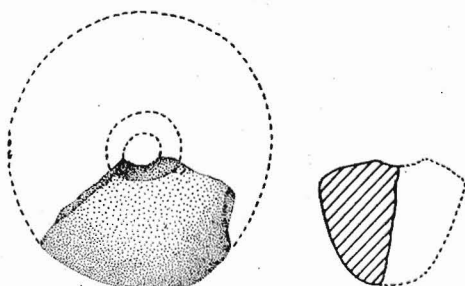
MC I, 622 (Fig. 8)

Flat oblong pebble of tuffaceous siltstone, trapezoid shape with rounded corners and thicker at wide end than at opposite end. Unfinished drilling of biconical perforation. Broken longitudinally across perforation. Length 12.2 cm; gr. width 5.8 cm; thickness 3.2 cm-4.3 cm; diameter of perforation 3.5 cm at top.

Fig. 8 MC I, 622 ($\times 1/3$)

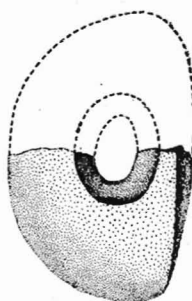
MC I, 683 (Fig. 9)

Almost circular pebble of silicified sandstone apparently having had a thick oval section and finished biconical perforation. Broken in the plane and with only about one-fourth of the circumference preserved. Width 10.8 cm-11.5 cm; thickness about 7 cm; diameter of perforation 3 cm at top, 2 cm at center.

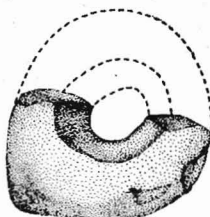
Fig. 9 MC I, 683 ($\times 1/3$)

*Lampang**MT II, S.144* (Fig. 10)

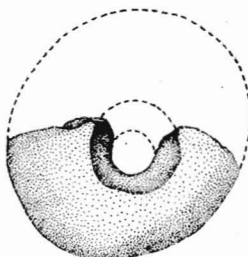
Oblong, almost oval pebble of red sandstone with thick oval section and finished biconical perforation with oval circumference. Broken transversely across perforation. Length 14 cm; width 8.2 cm; thickness 5.3 cm-6 cm; diameter of perforation 4.1 by 5.4 cm at top, 2 by 3.2 cm at center.

Fig. 10 *MT II, S.144* ($\times 1/4$)*MT VIII, 1* (Fig. 11)

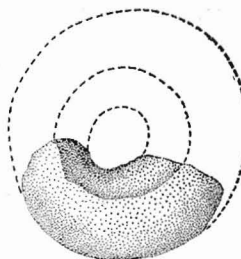
Fragment of rather thick rectangular-sectioned sandstone pebble with biconical finished perforation. Probably originally of square shape with rounded corners. Perforation may have had oval circumference. Broken transversely at perforation. Width 9.1 by 10.5 cm; thickness 5.1 cm; diameter of perforation 3.7 by 5.5 cm at top, 2 by 2.6 cm at center.

Fig. 11 *MT VIII, 1* ($\times 1/3$)*MT VIII, 2* (Fig. 12)

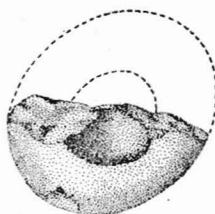
Fragment of flat oval pebble with oval section and acentral biconical finished perforation. Broken transversely at perforation, which is of slightly oval circumference. Width 10.5 cm by 9.2 cm; thickness 3 cm; diameter of perforation 3.3 cm by 3.7 cm at top, 1.7 cm at center.

Fig. 12 *MT VIII, 2* ($\times 1/3$)*MT VIII, 3* (Fig. 13)

A small fragment of a round quartzite pebble with hemispherical section and biconical finished perforation. Approximately one-third of tool preserved, broken across perforation. Width 8.3 cm; thickness 4.15 cm; diameter of perforation 4.7 cm at top, 1.3 cm at center.

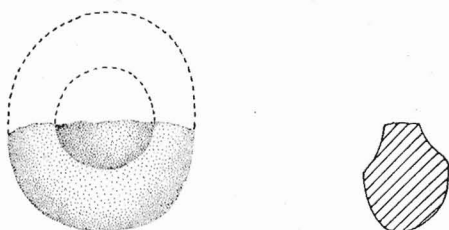
Fig. 13 *MT VIII, 3* ($\times 1/3$)*MT VIII, 4* (Fig. 14)

Fragment of oval pebble of quartzite with thick oval section and unfinished biconical perforation. Broken transversely across perforation during drilling. Width 8 cm by 9.5 cm; thickness 4 cm; diameter of perforation 4 cm at top.

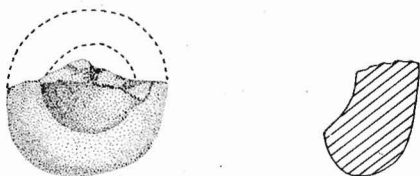
Fig. 14 *MT VIII, 4* ($\times 1/3$)

MT VIII, 5 (Fig. 15)

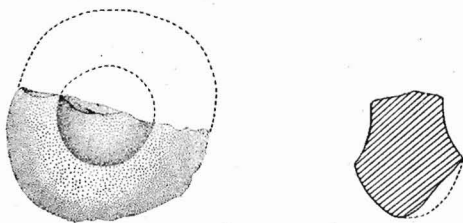
Fragment of oval, almost subrectangular pebble with flat oval section and unfinished biconical perforation. Sandstone. Broken transversely during drilling. Width 9 cm by 7.5 cm; thickness 3 cm; diameter of perforation 3.6 cm at top.

Fig. 15 *MT VIII, 5* ($\times 1/3$)*MM II, S.31* (Fig. 16)

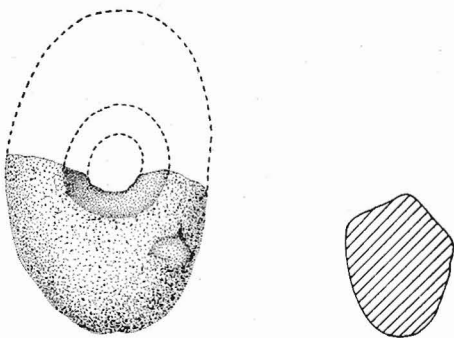
Fragment of nearly square sandstone pebble with oval section, likely to have had a biconical perforation, which, however, is started only from one face. Broken transversely across drilled groove. Width 6.3–6.5 cm; thickness 3 cm; diameter of perforation 3.8 cm at top.

Fig. 16 *MM II, S.31* ($\times 1/3$)*PS III, S.516* (Fig. 17)

Fragment of nearly circular quartzite pebble with thick oval section and biconical unfinished perforation. Broken transversely during drilling. Width 11.6 cm; thickness 6 cm; diameter of perforation 5 cm at top.

Fig. 17 *PS III, S.516* ($\times 1/5$)*P III, S.7* (Fig. 18)

Flat oval pebble with oval section and oval finished biconical perforation. Sandstone. Broken transversely across perforation. Length 13 cm; width 7.8 cm; thickness 4 cm; diameter of perforation 4–4.5 cm by 4.2 cm at top, 2 by 2.5 cm at center.

Fig. 18 *P III, S.7* ($\times 1/3$)

The finds presented here can briefly be said to consist of natural pebbles of different materials, all with the natural cortex preserved, ranging in shape from subquadrangular over rectangular to oblong, from oval to circular, generally with a comparatively flat to thick oval cross-section. From the point-of-view of raw materials, the finds must be characterized as extremely heterogeneous; the only attribute in common is biconical (hourglass-shaped) perforation. The perforation was done following a slight flattening of the place to be drilled. Except for this technical advance, both the drilling itself and the many broken pieces—usually broken during the process of drilling—may indicate that the technique was not

fully mastered. Again, the probable meaning is that the finds represent a fairly early technological stage in comparison with the skilled flaking of the Hoabinhian implements, which if they are not contemporary to the perforated stones here described, form the technological background to them.

Several other problems emerge from this collection. The first one, naturally enough, is that of function. Names implying functions, such as clubheads, maceheads, weightstones for digging sticks, ring stones, net sinkers, or bark beaters, have been or could be suggested. Most such suggestions could be accompanied by a series of arguments for and against the proposed name. However, I shall here limit myself to discussing the three most likely ones: macehead, net sinker, and weightstone.

Perhaps it is best to set aside the term macehead right away. The big difference in diameter of the perforation at the top and at the center will have been too serious an obstacle to proper hafting, as the hourglass-shaped perforation offers too little contact between head and shaft. When the head was damaged during use, one wonders why only half of it, rather than both pieces, should be left at the place of use/damage.

That all find spots are close to rivers partly supports a functional classification as net sinker. The fact that only one-half of the stone (the part tied to the net) is found, together with the lack of wear of the surfaces, further supports this designation. On the other hand, considering how many stones apparently broke during the drilling of the central hole, it would presumably have been easier just to braid some fibers around a stone and then attach it to the net, as is still being done.

To explain these specimens as weightstones for digging sticks is also difficult. Generally a digging stick is nothing more than a branch, pointed at one end and sometimes with one or two small twigs retained, at which a perforated stone could of course be hung. The overall homogeneity of size and shape of the perforations fits well with the size of a small twig, but again one wonders why only half of the stone is found at the settlement. Besides, it is very difficult to imagine why they should break at all; the stick would be more likely to break than the stone. But even if this is acceptable, then it is harder to accept the fact that the weights of the stones, which one should expect to be very similar, differ from 225 gr to 1000 gr (although admittedly a majority—13 out of 18—are between 225 gr and 550 gr). Most of all, why are they absent from a site like Spirit Cave in Mae Hongson (Gorman 1970), where at least some slight indications of an incipient horticulture are present? Such a stage would be the proper cultural background for their presence. Given these confused circumstances, I have found it better to refrain from applying a function-indicating type-name for this group of artifacts and instead propose the use of a more neutral name like perforated stones.

Another problem which emerges and needs to be discussed is that of their chronology and cultural context and relationship. Most of the evidence—although it is still sparse—is from the Mae Cham I site, from which there are strong indications that they belong to a very late phase of the Hoabinhian or rather to some Epi-Hoabinhian, culturally transitional phase (to judge from the simple adzes)—a phase perhaps similar to but not related with the Bacsonian. The alternative may be that they represent an intrusive element or group from a hitherto unknown area or culture. Further studies of the material already collected from Mae Cham I,

together with surveys and perhaps an excavation of a limited area at the site, will most likely throw new light on this interesting topic.

At the present state of research it can be said that perforated stones were totally absent from "the classical Hoabinhian" as represented in Tam Phra, Sai-Yok, Kanchanaburi (van Heekeren and Knuth 1967), the upper preceramic horizon of which seems to correspond to the lowest or two lowest layers at Mae Cham I. Nor were they in the "late Hoabinhian" layers in Tam Ongbah, Sri Sawat, Kanchanaburi, which are C-14 dated from 9230 B.C. \pm 180 to 7400 B.C. \pm 140 (Sørensen 1973: 166), layers which correspond in contents to the upper horizons at Mae Cham I. Neither are they known from any of the open-air sites of Hoabinhian affinity or the Ban Kao culture sites from Ban Kao, Kanchanaburi (Sørensen, in press). Their total absence from Kanchanaburi—although this province borders the Changwat Tak—may of course be due to a geographical limitation of the distribution of the type, even if this appears somewhat unlikely as long as we are confronted with sites at only a short distance from each other within the same mountain range, that is, the same ecological zone. The most obvious conclusion to be drawn is that the perforated stones most likely are chronologically later than the Hoabinhian finds from Kanchanaburi but probably have disappeared from the scene before the advent of the Ban Kao culture (approximately 1800 B.C.).

Returning to the north, Spirit Cave's cultural level I largely resembles the uppermost Hoabinhian layer of the Ongbah Cave, so it may be possible that a chronological correspondence also exists between these two sites, and that the same dates are applicable to the upper horizons of the Mae Cham I site too. But, as has been mentioned, perforated stones are absent from Spirit Cave level I as well as the subsequent cultural level II, which has some cord-marked sherds. Level II is dated 6826 B.C. \pm 290 to 5672 B.C. \pm 300 (Gorman 1970: 98). Considering further the relatively short distance separating Mae Cham I from Spirit Cave, and the even shorter distance between the latter and the Doi Sakhet Cave, which contained Hoabinhian implements, cord-marked pottery, and a perforated stone fragment, the possibility exists of a cultural connection between early cord-marked pottery horizons and perforated stones, perhaps slightly younger than that at Spirit Cave. The latter possibility finds no further support from the collection from Thailand as presented above. None of the perforated stones was ever found associated with cord-marked pottery. On the contrary, at site PS III no sherds even were in any of the abundant pits found during the excavation of that site, while the closest find containing cord-marked sherds was at site PS IV, which is more than 8 km from site III. Site IV, however, had no perforated stones.

The theory of a connection between cord-marked pottery and perforated stones gets some support from Burma, where the Padah-lin Cave (Thaw 1971) has these two elements together with a Hoabinhian assemblage, all of which, according to the excavator, are in a culturally homogeneous deposit. Three sets of datings are reported from Padah-lin, two of which, on bone collagen, are 11,450 B.C. \pm 200 and 9300 B.C. \pm 200. These dates correspond very well with those of Spirit Cave cultural level I as well as those of Ongbah, where in both locations they are exclusively with Hoabinhian assemblages. It may then be that these dates in Burma too are actually related to the Hoabinhian assemblage of the Padah-lin caves, despite the excavator's statement, and that the strangely corresponding dates on charcoal

and bone carbonate relate rather to the cord-marked pottery. These dates, ranging from 5790 B.C. \pm 125 to 4280 B.C. \pm 90, in that case denote a phase later than the one represented by Spirit Cave cultural level II. However, this does not leave us with any indication of the relationship of the perforated stones, as they may belong equally well to either of the two proposed horizons. If, on the other hand, the excavator of Padah-lin is right in his suggestion that the cultural assemblage here is a unit, which is largely supported by the evidence from Laang Spean, Cambodia (C. and R. Mourer 1970), then one had better overlook the bone collagen dates from Padah-lin. In this case a Hoabinhian with cord-marked pottery and perforated stones is datable at about 5790 B.C. to 4280 B.C. The latter range also fits chronologically with the evidence from Laang Spean, where cord-marked pottery is in a Neolithic setting without indication of grinding or polishing of tools at a date of 4290 B.C. \pm 70 to A.D. 750 \pm 70. The latter date refers especially to the cord-marked sherds. Unfortunately, no perforated stones are reported from this site either, so finally we reach a blank wall.

It should, however, be remarked that perforated stones are known from India, where they apparently occur in preceramic contexts (Narr 1966: 361). The context here is less significant than the interesting extension westward of the distribution of the type, as this is otherwise unrecorded from the Southeast Asian mainland as well as the archipelago. At present I have not been able to find any indication of the age of the stones in India, which would be very important in connection with the problem of their origin. Information about age might shed light on whether they represent something intrusive in the Shan State area of Burma/North Thailand, where they are present, or whether in India they reflect some contacts with South-east Asia earlier than those represented by the shouldered adzes.

To summarize, we are confronted here with an extremely simple artifact (a) the function of which is difficult to determine; (b) which has a distribution from India to the northern part of the Southeast Asian mainland between 18° and 20° North; (c) the cultural context of which so far is undetermined, but which may be a late phase of the Hoabinhian, a transitional phase between the Hoabinhian and an incipient horticultural stage, or (intrusive into?) in an early but not the earliest phase of the corded-ware culture; (d) in all three cases apparently to be dated somewhere between 6000 B.C. and 3000 B.C.

Regardless of how meager the material and conclusions presented here may seem to be at the moment, it appears to me that the perforated stone is an artifact which has the possibility of becoming an important chronological and cultural key type, a horizon marker useful for long-distance correlations and connections at a crucial period in human evolution.

ACKNOWLEDGMENTS

The finds discussed here, as well as all other finds collected and excavated by the Scandinavian Institute of Asian Studies (SIAS), Lampang, are now in the custody of the Royal Thai Fine Arts Department.

I am most grateful to the Royal Thai Fine Arts Department and The National Research Council of Thailand for the general permit to survey in the North of Thailand during my stay of five years. I am further indebted to Mallika and Maliwan

Angsuthornrangsi, then on the staff of the SIAS, Lampang, for all their help in collecting these and other finds as well. In addition, Maliwan made the drawings of the finds presented here.

ADDENDUM

After this article was submitted for publication, the results of the dating of four charcoal samples from site PS III were received. They are as follows:

K-2469, 2790 ± 100 before 1950 (840 B.C.)

K-2470, 4980 ± 100 before 1950 (3030 B.C.)

K-2471, 1130 ± 100 before 1950 (A.D. 820)

K-2472, 4580 ± 100 before 1950 (2630 B.C.)

K-2471 is most likely contaminated. If it is not, then it indicates, like the other samples, that this place was inhabited at different times during the recent past (the main settlement being Early Palaeolithic). Consequently, it is difficult to state from which of the periods of settlement the perforated stone (Fig. 17) dates, although most evidence points to its derivation from a pit very close to, if not the same as, the one from which K-2469 comes. This means that it might possibly be dated at 840 B.C., as the charcoal is from the bottom of the pit. Also recovered from here were several insignificant atypical "epi-Hoabinhian" flaked stones, but there was not pottery whatsoever. From this evidence it seems unlikely that the perforated stones should be older than 3000 B.C., which is in good harmony with statements above on their "epi-Hoabinhian" relationship and dating.

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